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Effect of Mannitol on in Vitro Conservation of Local and Exotic Taro-Genotypes (Colocasia Esculenta Var Esculenta)

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Abstract : Taro [Colocasia esculenta (L.) Schott] is a major staple food and remains a significant crop to many cultural and agricultural customs worldwide. In Ghana, taro is mostly propagated using vegetative material, which is conserved in field collection and recycled from their farms to establish new fields. However, this practice promotes the accumulation of systemic pathogens. Prior exposure to pests and subsequent expression of disease symptoms can also be a huge constraint to sustainable conservation and utilization of taro genetic resources. In vitro, slow growth is one of the most promising techniques to be utilized for conservation. The objective of this study was to find a medium-term in vitro conservation protocol for local and exotic taro genotypes. The medium-term conservation study was conducted using actively growing shoots obtained from in vitro cultures. Explants were cultured to full strength in complete Murashige and Skoog medium supplemented with Mannitol at different concentrations (0g/l, 20g/l, 25g/l, and 30g/l). Another medium that was tested as an additional treatment is the White's medium. The highest number of shoots (6.33) and leaves (22.67) occurred on medium containing 20 and 25g/l mannitol in genotype SAO 006 as compared to other genotypes, whereas 30g/l mannitol was the best to restrict growth for the entire 6 months period in terms of shoot height (22.50cm). The study reveals that mannitol supplemented culture media could reduce the growth of Colocasia plantlets, especially in stem height. Culture growth following 6 months of conservation, showed that healthy shoot cultures of Taro were obtained after 6 months of storage in a medium containing $20gl^{-1}$ and $25gl^{-1}$ mannitol.

Keywords : complete murashige, skoog medium, culture conditions, mannitol, slow growth conservation
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